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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/630,613	07/30/2003	Ming Zheng	CL2191US NA	3957

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EXAMINER

FORMAN, BETTY J

ART UNIT

PAPER NUMBER

1634

DATE MAILED: 04/12/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/630,613	<b>Applicant(s)</b> ZHENG ET AL.	
	<b>Examiner</b> BJ Forman	<b>Art Unit</b> 1634	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 07 February 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-31 is/are pending in the application.
- 4a) Of the above claim(s) 1-19 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 20-31 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

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**DETAILED ACTION**

***Election/Restrictions***

1. Applicant's election without traverse of Group II, Claims 20-31 in the reply filed on 7 February 2006 is acknowledged.

Claims 1-19 are withdrawn from further consideration.

Claims 20-31 are under prosecution.

***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 28-29 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 28 and 29 are indefinite in Claim 28 for the recitation "the functional group" because the recitation lacks proper antecedent basis in Claim 20. It is suggested that the claims be amended to provide proper antecedent basis. The claim is further indefinite because Claim 20 requires that the complexes be affixed to each other through a distal portion of the ligand. Claim 28 appears to contradict the distal-portion complexing of Claim 20. It is suggested the claim be amended to clarify.

***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

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A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 20-28, 30-31 are rejected under 35 U.S.C. 102(e) as being anticipated by Mirkin et al (U.S. Patent No. 6,361,944, filed 25 June 1999).

Regarding Claim 20, Mirkin et al disclose a geometric nanostructure comprising at least three complexes, the complexes comprising a nanoparticle (Abstract) and a ligand, wherein the ligand has a proximal portion attached to the nanoparticle (i.e. functional group at the terminal end of the oligo, Column 17, lines 15-67) and a distal portion (e.g. nucleic acid sequence) wherein the complexes are each affixed to each other through the distal portion (e.g. via hybridization and aggregation as illustrated in Fig. 5 and 25B).

Regarding Claim 21, Mirkin et al disclose the nanoparticle having a diameter of 2 to 10 nm (i.e. “about 5nm”, Column 16, lines 36-38).

Regarding Claim 22, Mirkin et al disclose the nanoparticle is comprised of metals or semiconductors (Column 16, lines 40-42).

Regarding Claims 23-24, Mirkin et al disclose the nanostructure wherein the ligand is nucleic acid or peptide nucleic acid (Column 42, lines 15-30).

Regarding Claim 25, Mirkin et al disclose the nanostructure wherein the ligand is derivatized to include a functional group at the distal end (e.g. hydrophobic group, Column 3, lines 37-42) or (e.g. labels, Column 6, lines 29-36).

Regarding Claim 26, Mirkin et al disclose the nanostructure wherein the functional group is a NH<sub>2</sub> C7 (Column 58, lines 38-62).

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Regarding Claim 27, Mirkin et al disclose the nanostructure wherein the ligand is a nucleic acid and the complexes are affixed by hybridization of distal portions of the nucleic acid (i.e. via hybridization and aggregation as illustrated in Fig. 5 and 25B).

Regarding Claim 28, Mirkin et al disclose the nanostructure of Claim 20 wherein the ligand (nucleic acid) has a functional group that is a first member of a binding pair and wherein the complexes are affixed to a second member of the binding pair (i.e. the first member is the distal nucleic acid sequence wherein hybridization to the complementary sequence (i.e. the second member of the binding pair) affixes the complexes (i.e. via hybridization and aggregation as illustrated in Fig. 5 and 25B).

Regarding Claim 30, Mirkin et al disclose a geometric nanostructure comprising at least two complexes, the complexes comprising a nanoparticle (Abstract) and a ligand, wherein the ligand has a proximal portion attached to the nanoparticle (i.e. functional group at the terminal end of the oligo, Column 17, lines 15-67) and a distal portion (e.g. nucleic acid sequence) wherein the complexes are each affixed to each other through the distal portion (e.g. via hybridization and aggregation as illustrated in Fig. 5 and 25B) and wherein the complexes take the form of mixtures of dimers, trimers or tetramers (Fig. 25).

Regarding Claim 31, Mirkin et al disclose the nanoparticle having a diameter of 2 to 10 nm (i.e. "about 5nm", Column 16, lines 36-38).

6. Claims 20-31 are rejected under 35 U.S.C. 102(b) as being anticipated by Barbera-Guillem et al (U.S. Patent No. 6,261,779, issued 17 July 2001).

Regarding Claim 20, Barbera-Guillem et al disclose a geometric nanostructure comprising at least three complexes, the complexes comprising a nanoparticle (Abstract) and a

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ligand, wherein the ligand has a proximal portion attached to the nanoparticle (i.e. the nanocrystal is linked to the polynucleotide, Column 5, line 63-Column 6, line 62 and Example 2) and a distal portion (e.g. nucleic acid sequence) wherein the complexes are each affixed to each other through the distal portion (e.g. via hybridization to form a dendrimer as illustrated in Fig. 3-8).

Regarding Claim 21, Barbera-Guillem et al disclose the nanoparticle having a diameter of 2 to 10 nm (Column 10, lines 15-17).

Regarding Claim 22, Barbera-Guillem et al disclose the nanoparticle is comprised of metals or semiconductors (Column 10, lines 18-25).

Regarding Claim 23, Barbera-Guillem et al disclose the nanostructure wherein the ligand is a protein, nucleic acid, peptide nucleic acid or oligomer (Column 4, lines 4-20).

Regarding Claim 24, Barbera-Guillem et al disclose the nanostructure wherein the ligand is nucleic acid or peptide nucleic acid (Column 4, lines 10-15).

Regarding Claim 25, Barbera-Guillem et al disclose the nanostructure wherein the ligand is derivatized to include a functional group at the distal end (Column 17, lines 29-66).

Regarding Claim 26, Barbera-Guillem et al disclose the nanostructure wherein the functional group is a NH<sub>2</sub> with 1-12 carbon, thiol groups with 1-12 carbon, biotin group with 1-12 carbon i.e. the free ends are capped using one of many functional groups (Column 8, lines 11-32; Column 17, lines 29-66; and Column 18, line 44-Column 19, line 22).

Regarding Claim 27, Barbera-Guillem et al disclose the nanostructure wherein the ligand is a nucleic acid and the complexes are affixed by hybridization of distal portions of the nucleic acid (as illustrated in Fig. 3-8).

Regarding Claims 28-29, Barbera-Guillem et al disclose the nanostructure of Claim 20 wherein the ligand (nucleic acid) has a functional group that is a first member of a binding pair (e.g. biotin) and wherein the complexes are affixed to a second member of the binding pair (e.g. avidin) (Column 17, lines 29-66).

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Regarding Claim 30, Barbera-Guillem et al disclose a geometric nanostructure comprising at least three complexes, the complexes comprising a nanoparticle (Abstract) and a ligand, wherein the ligand has a proximal portion attached to the nanoparticle (i.e. the nanocrystal is linked to the polynucleotide, Column 5, line 63-Column 6, line 62 and Example 2) and a distal portion (e.g. nucleic acid sequence) wherein the complexes are each affixed to each other through the distal portion (e.g. via hybridization to form a dendrimer as illustrated in Fig. 3-8) and wherein the complexes take the form of mixtures of dimers , trimers or tetramers (Fig. 3-8).

Regarding Claim 31, Barbera-Guillem et al disclose the nanoparticle having a diameter of 2 to 10 nm (Column 10, lines 15-17).

### **Conclusion**

7. No claim is allowed.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to BJ Forman whose telephone number is (571) 272-0741. The examiner can normally be reached on 6:00 TO 3:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ram Shukla can be reached on (571) 272-0735. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

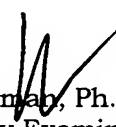
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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to (571) 272-0547.

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BJ Forman, Ph.D.  
Primary Examiner  
Art Unit: 1634  
April 7, 2006